

Application No. 10/021,602
Amendment dated September 17, 2004
Reply to Office Action of June 17, 2004

Remarks

Applicants have cancelled claims 1-4, and 6-42, amended claim 5 and added new claims 43-57. Claims 5 and 43-57 remain in the application. Applicants respectfully request reconsideration of the amended and new claims.

Applicants confirm the election without traverse to prosecute the invention of Group 1, namely claims 1-7, 41 & 42 that are drawn to a cover slip/slide apparatus and method for forming a reaction chamber therewith as shown in Fig. 1.

Claims 41 and 42 are rejected under 35 U.S.C., §102(e) as being anticipated by U.S. Patent No. 6,489,171 to Aghassi et al. Claims 41 and 42 have been cancelled, and therefore, Applicants submit that this rejection should be withdrawn.

Claims 1-7 are rejected under 35 U.S.C., §103(a) as being unpatentable over U.S. Patent No. RE 35,589 to Fisch in view of US Patent No. 4,171,866 to Tolles. Claims 1-4 and 6-7 are cancelled, and therefore, the following remarks are directed to the amended claim 5.

Fisch relates to a biological assembly that facilitates the counting of cells in a liquid sample under magnification using a grid etched into slide covers. In Fig. 1, Fisch shows a slide 2 and slide covers 3, 3' separated by a film 23 and a separating wall 26. In Figs. 3a and 3b, a slide cover 40 has thin film spacers 49 located at the corners of the slide cover. In Fig. 3c, the slide cover 40 has a film pattern 46' that can act as a spacer, and its diameter can be increased to eliminate the spacers 49. The device in Fisch is designed expressly so that a liquid sample can be observed under a microscope through the slide cover.

Tolles relates to a hemocytometer and shows a prior art device in Figs. 1 and 2 having glass base plate 11 with upwardly extending integral lands 12. A cover glass 13 is placed over the lands 12. In Figs. 3 and 4, a slide assembly 17 has a pair of spaced parallel taped sections 19 extending between, and adhered to, a base plate 18 and cover slips 20. To facilitate viewing with a microscope, the cover slips 20 have a thickness of 0.18 mm.

In order to establish a prima facie case of obviousness, it is necessary that the Office Action present evidence, preferably in the form of some teaching,

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suggestions, incentives or inference in the applied prior art or, in the form of generally available knowledge, that one having ordinary skill in the art would have been led to arrive at the claimed invention.

Applicants submit that a prima facie case of obviousness is not made because the cited references in combination do not teach, suggest or motivate one to provide a hybridization apparatus having the following elements recited in amended claim 5.

1. A pair of spacer segments attached to a bottom surface of a cover slip, wherein each of the spacer segments extends along substantially a full length of a different one of the opposed edges of the cover slip.

In Fisch, the spacers 46, 49 of Fig. 3 are applied to the lower surface 42 of the slide cover 40, but they do not extend over substantially a full length of opposed edges of the slide cover 40. Similarly, in Figs. 1 and 2 of Tolles, the lands 12 are formed in the base plate 11; but the lands 12 do not extend along the edges of the cover glass 13. With respect to the embodiment of Figs. 3 and 4, the taped sections 19 do not extend along the edges of the cover slips 20.

2. The cover slip has a thickness sufficient to provide a cover slip beam stiffness that prevents adhesion forces created by the introduction of hybridization liquid into the hybridization chamber from substantially changing a substantially constant distance between the bottom surface of the cover slip and the top surface of the substrate.

In Fisch, the liquid is first introduced into sample chamber 24 and is allowed to flow into the overflow chamber 25. Thereafter, the slide cover 3 is applied to the top of the slide; and the placing of the slide cover on the slide forces excess fluid into the overflow chamber 25, col. 4, lines 26-34. Further, Fisch has extensive film separators 23 and separating walls 26 and 46 that define a relatively small sample chamber 24. With such a small chamber, Applicants submit that there is little probability of a slide cover bending or flexing in a way that would change the volume

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of the sample chamber. Hence, the problem of cover slide bending or flexing is not an issue in Fisch.

In contrast, the apparatus of claim 5 has spacer segments along the opposed edges of the cover slip; and the hybridization chamber spans the full distance across the cover slip between the spacer segments. Further, the cover slip is first placed over immobilized hybridization material and the substrate and then a hybridization fluid is introduced. That process has a tendency to deflect the cover slip and provide an uneven distribution of the hybridization fluid, which ultimately can lead to a lower quality hybridization process. Fisch does not express or suggest a cover slip with a thickness sufficient to provide a beam stiffness that prevents adhesion forces created by the introduction of hybridization liquid into the hybridization chamber from changing a distance between the cover slip and the substrate.

With Tolles, the hemocytometer is first assembled by placing the cover slips over the double sided tape adhered to the glass base plate; and thereafter, fluid is introduced into the chambers formed between the cover slips and the base plate. Again, the tape strips are located inward from the edges of the cover slips, thereby forming a chamber that is about only 25% of the area of the cover slip. With such a small chamber, Applicants submit that there is less probability of creating forces sufficient to flex the cover slip. There is nothing in Tolles to suggest that a slight bending of the cover slips in any way interferes with the counting of particles or cells suspended in the fluid. To the contrary, the Tolles cover slips are only 0.18 mm thick and thus, relatively thin. Contrary to the requirement of claim 5, Tolles does not express or suggest providing a cover slip with a thickness sufficient to provide a beam stiffness preventing adhesion forces created by the introduction of hybridization liquid into the hybridization chamber from changing a distance between the cover slip and the substrate.

Applicants submit that a prima facie case of obviousness is not made because the claimed invention is directed to a substantially different problem than Fisch and Tolles. Both Fisch and Tolles are directed to creating a chamber for counting particles or cells under a microscope; and to make the counting process

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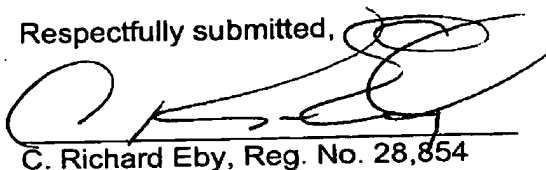
more efficient, the sample chamber area consumes only small area of a slide cover. Hence, bending of the slide cover is not an issue. In contrast, the apparatus of claim 5 is directed to creating a hybridization chamber between a cover slip and a substrate. The chamber is created by spacer segments extending along opposed edges of the cover slip, and hence, the chamber spans all the area of the cover slip between the spacer segments. With such a large cover slip area, flexing of the cover slip is an issue. Thus, Applicants submit that neither Fisch nor Tolles is directed to hybridization chambers, or to solving problems relating to the use of a flexible cover slip when building a hybridization chamber in a laboratory.

Applicants submit that a prima facie case of obviousness is not made because there is nothing in Fisch or Tolles to suggest their combination. The parallel spacers of Tolles do not provide a closed chamber having a precise volume that is provided by the circular wall 46 of Fisch.

Fisch and Tolles in combination do not express, suggest or motivate one to provide the structure for a hybridization chamber recited in claim 5. Thus, Applicants submit that the combination of Fisch and Tolles fails to provide a prima facie argument of obviousness and that claims 5 and 43-57 are patentable and not obvious under 35 U.S.C. §103(a) over Fisch in view of Tolles.

Applicants respectfully submit that the application is now in condition for allowance and reconsideration of the application is respectfully requested. The Examiner is invited to contact the undersigned in order to resolve any outstanding issues and expedite the allowance of this application.

Respectfully submitted,



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